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Analysis of the Factors Affecting the Gross Foreign Exchange Reserve Adequacy of the Central Bank of the Republic of Turkey with Logit and Probit Methods

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Abstract

The adequacy of the Central Bank of the Republic of Turkey's (CBRT) gross foreign exchange reserves according to the IMF's optimal reserve ratios was investigated in the study. To that end, the best reserve size ratios of total reserves to 25 percent of M2 monetary size, 20 percent of 3-month import data, and short-term external loan volume are explored first. According to the findings, the optimal reserve level in the empirical phase of the study was chosen as the ratio of reserves to M2 monetary size, because the ratios of imports of national reserves and short-term external debt coverage were below the proposed optimum level. Monthly data from January 2013 to June 2021, as well as macroeconomic factors influencing the best foreign exchange reserve threshold value, were studied in the model using Logit and Probit approaches. Increases in inflation and short-term external debt volume, according to the research, enhance the likelihood that foreign exchange reserves will fall below the ideal reserve ratio.

***Keywords**: CBRT, FX reserves, Optimal FX reserves*

***JEL Classification**: C01, C02, C45*

Türkiye Cumhuriyet Merkez Bankası'nın Bürüt Döviz Rezervleri Yeterliliğine Etki Eden Faktörlerin Logit ve Probit Yöntemleri ile Analizi

Özet

Bu çalışmada Türkiye Cumhuriyeti Merkez Bankasının (TCMB) Brüt Döviz Rezervlerinin, IMF'nin önerdiği optimum rezerv oranlarına göre yeterliliği incelenmiştir. Bu amaçla ilk önce optimal rezerv büyüklükleri olan toplam rezervlerin M2 parasal büyüklüğünün %25`ne, 3 aylık ithalat verilerinin %20`ne ve kısa vadeli dış borç hacmine olan oranları ele alınmıştır. Elde edilen bulgulara göre, ulusal rezervlerin ithalatı ve kısa vadeli dış borçları karşılama oranları önerilen optimum düzeyin altında değerler aldığı için, çalışmanın ampirik bölümünde rezervlerin M2 parasal büyüklüğüne oranı optimum rezerv seviyesi olarak seçilmiştir. Logit ve Probit yöntemleri ile çözümlenen modelde, 2013 yılının ocak ve 2021 yılının haziran ayları arasındaki periyodu kapsayan aylık veriler ile optimum döviz rezervi eşik değerine etki eden makro iktisadi faktörler araştırılmıştır. Bulgulara göre, enflasyonda ve kısa vadeli dış borç hacminde yaşanan artışlar, döviz rezervlerinin optimum rezerv oranının altına düşmesi olasılığını artırmaktadır.

***Anahtar Kelimeler**: TCMB, Döviz rezervleri, Optimum döviz rezervleri*

***JEL Sınıflandırması**: C01, C02, C45*

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1. Introduction

Central bank reserves are official public assets that are made up of foreign assets that are held and regulated by monetary authorities. These assets are held for transactional as well as precautionary purposes. Reserves are typically utilized to cover payment imbalances on the country's behalf as well as interventions in foreign exchange markets. The number of reserves held by a country is an essential indicator of that country's capacity to pay its debts and maintain monetary stability. The major reasons for central banks to have liquid reserves are to build a defence mechanism against potential speculative attacks or changes in the trade balance.

The fact that the central bank keeps reserves and that this reserve amount is large enhances the central bank's monetary policy implementation throughout the country. That is, foreign exchange reserves are critical in the event of exchange rate shocks or financial crisis signals, when demand for foreign currency grows in the domestic market, or in terms of supplying an increase in foreign exchange demand to satisfy rising import demand. At the same time, in some situations caused by internal and external economic events, reserves are utilized to fund key events on behalf of the country when local or central budgets are unable to pay. Foreign money reserves, for example, are also employed in occurrences such as natural catastrophes and epidemic situations around the country. In addition to this, foreign exchange reserves are utilized to pay the central government's external debts. In such cases, foreign exchange reserves can be regarded as the country's "monetary prudence." Whether it's the 2008 Global Crisis or the financial crises of the 1990s, we can observe that the countries chosen based on their reserve size were able to recover more swiftly from the financial imbalances caused by the crises.

Although there are differing views in the literature on the appropriate size of foreign exchange reserves, the IMF's criteria are largely acknowledged. This criterion will be mentioned in the following section, and the level of Turkey's reserve sizes based on these criteria will be discussed. The year-on-year declines in the Central Bank of the Republic of Turkey's (CBRT) foreign exchange reserves in recent years have elicited a strong public outcry. The fact that the central bank's net balance sheet, which had previously been criticized due to the turnover of three CBRT presidents in a short period of time, is now negative has intensified these talks and has even been utilized in political propaganda. These disputes did not end after the CBRT stated that it used a considerable amount of foreign exchange sales to stabilize exchange rate movements, and the CBRT's reserve management methods were heavily criticized.

Although there are differing views in the literature on the minimal amount of Central Bank foreign exchange reserves, the threshold values in the IMF report published in 2000 are the most acceptable ideal levels. In this study, it was determined whether these threshold levels are adequate for the Central Bank of the Republic of Turkey's Gross Foreign Exchange Reserves. The ratio of reserves to cover imports and short-term foreign loans has been established to be relatively insufficient, although the ratio of meeting the monetary size of M2 is sufficient in some periods. In the empirical section of the study, Logit-Probit models were used

to evaluate the macroeconomic determinants influencing the Central Bank's likelihood of meeting 25% of M2 monetary size. The effect of the variables, which are confirmed by empirical research that Central Banks have an impact on their FX Reserves, on the Central Bank's Optimal FX Reserve level has been explored in this context.

2. Turkey and the Optimal Size of Central Bank Reserves

In response to the 2008 financial crisis, major central banks decreased policy interest rates in order to stimulate their economies, while also dramatically increasing the quantity of reserves in the banking system (Fuhrer, et al., 2020: 2). When it comes to the crisis periods that began with the bankruptcy of Lehman Brothers, one of the largest banks in the United States, it was observed that there were central banks that did not bear the cost of holding reserves, as well as central banks that had accumulated a significant amount of foreign exchange and gold reserves by learning from previous years' financial crises. Following the crisis, there was an argument that the countries chosen based on the size of their central bank reserves, both during the crisis and in terms of overcoming the crisis, fared better. In addition to this debate, discussions about ideal reserve sizes have grown in the literature (Caspedes et al.,2014:13). The major objective of retaining reserves, according to Heller (1966), is to eliminate increases in external liabilities and disturbances in the balance of payments. According to Jeanne and Ranciere (2011), reserve size is critical for preserving economic integrity in the face of financial internal and external shocks. The opportunity cost of retaining reserves, according to the authors, is quite significant when compared to the scenario of financial inactivity or balance shift caused by external financial shocks. The potential cost of reserves is frequently defined in the literature on international reserves by referring to the swaps involved in changing the composition of the country's balance sheet. The gap between the interest rate paid on the country's liabilities and the lower return on reserves is known as the opportunity cost of reserves (Rodrik, 2006:223). In the face of external shocks, Cespedes and Chang'a (2020) refer to reserves as "war chests." According to the authors, as long as central bank reserve sizes are greater than the ideal reserve ratio, resilient monetary policies can be implemented in the face of changes in the external balance.

Discussions about the ideal reserve size of central banks are common in the relevant literature (Rodrik, 2006: 256). According to Frenkel and Jovanovic (1981), a country's foreign exchange reserves should be sufficient to cover imports and foreign debts in the event of a trade shock. Similarly, Schherbakov (2002) claimed that the amount of the reserve can significantly improve the country's external position. Furthermore, he emphasized the degree of overlap between variables such as external debt adequacy, import adequacy, monetary aggregate adequacy, and reserve capacity. According to Garcia and Soto (2004), if a country's foreign exchange reserves are sufficient to meet its external debts due in one year, it is economically healthy and robust to potential external shocks. That is, the foreign exchange reserves to short-term debt ratio is one. It should be higher (Cinel, 2015:5). According to the IMF's reserve size to import coverage ratio criterion,

which was proposed in 2000 and has yet to be changed, the foreign exchange reserve should be sufficient to cover imports for three or six months, assuming that money inflows and outflows to the country halt. It is also one of the important conditions that the amount of the foreign exchange reserve, along with the short-term foreign debt and import coverage ratio, should fulfil a specified portion of the M2 monetary size (Ahsan et al., 2006: 11). This metric is especially significant in nations with poor banking institutions. In a financial or currency crisis, the country's local currency must be swapped for foreign currency, hence a reserve amount is required to match the demand for this shift. According to the IMF, this value ranges between 5 and 20%. (Colomoris, 2000: 9).

According to both studies in the literature and the opinions of economic policymakers, there are numerous perspectives on the appropriate level of reserve size. According to supporters of the minimalist reserve level, sufficient reserves must be kept to meet the aforementioned conditions. Reserves stored in excess of specified amounts are inconvenient in terms of holding costs. Those who accept this viewpoint criticize Asian countries for being specifically chosen for a period of reserve size (Pineau et al., 2006: 12). The relationships between central bank reserve sizes and other macroeconomic indicators are examined from the same angle in more recent studies.

In our analysis, we will use the IMF's suggested reserve/3-6 month imports, reserve/one-year external debt, and reserve/20 percent of M2 money supply to analyse the above indicators of Turkey's reserve size. The following tables provide the values of the relevant indicators for the years 2013-2020:

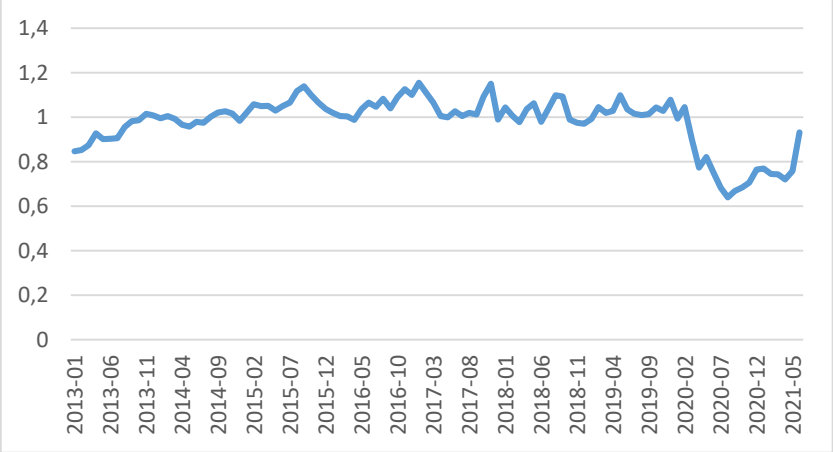

Figure 1: Ratio of Gross Central Bank Reserves to M2 Money Supply

Source: CBRT, https://evds2.tcmb.gov.tr/

According to the commonly acknowledged ratio, the Central Bank's reserve to M2 monetary size should be between 5 and 20%. The reserve amount is observed to meet this percentage for all periods between 2013 and 2020.

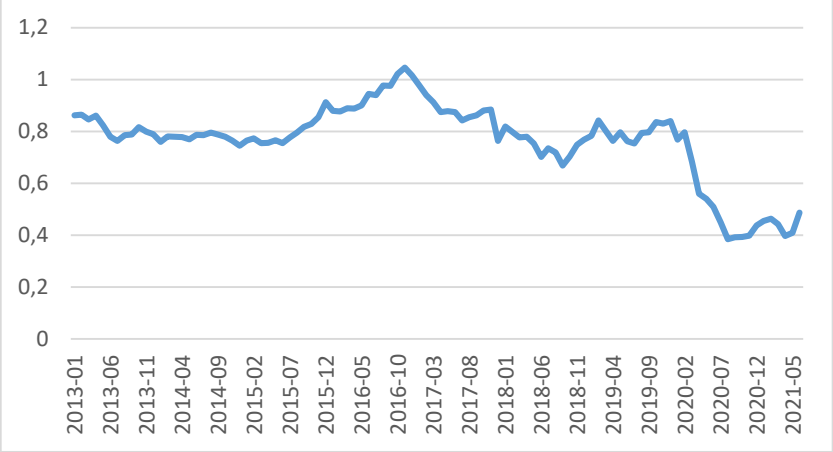

Figure 2: Ratio of Gross Central Bank Reserves to Short-Term External Debt

Source: CBRT, https://evds2.tcmb.gov.tr/

The fact that the ratio of central bank reserves to debt amounts due within a year is well below one can be viewed as a warning of an impending foreign debt crisis. This rate, which has been gradually declining, is seen as a very poor measure of Turkey's credibility in the foreign market, particularly in relation to the CDS (Credit Risk Premium).

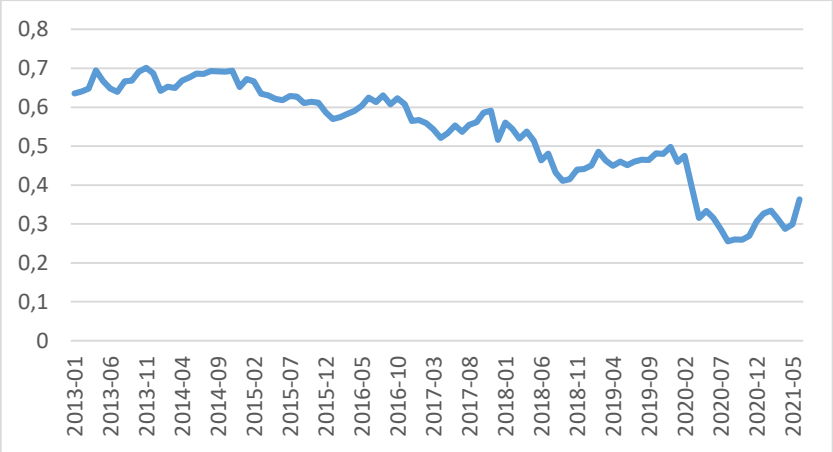

Figure 3: 3-Month Import Ratio of Gross Central Bank Reserves

Source: CBRT, https://evds2.tcmb.gov.tr/

When we look at the import coverage ratios of the Central Bank's reserves, we observe that they are significantly below the 1 value, just as short-term debt coverage. This metric, which stayed unchanged between 2013 and 2020, is yet another proof of the Central Bank's low reserves.

Figure 4: Central Bank Gross Reserves

Source : CBRT, https://evds2.tcmb.gov.tr/

3. Empirical Implementation

In the empirical section of the study, Logit-Probit methods were used to examine the link between the Central Bank's FX Reserve Adequacy levels and the related macroeconomic variables. These indicators are: FX Reserves/M2 (20% of money supply), FX Reserves/3-Monthly (25% of imports), and FX Reserves/Short-Term External Debt (20% of imports). As indicated in the theoretical section of the study, the fact that these values are greater than one suggests that the quantity of the reserve is sufficient, and that these values are less than one shows that the amount of the reserve is insufficient. Because the FX Reserves/3-Monthly Imports and FX Reserves/Short-Term External Debt indicators in Turkey for all periods between January 2013 and May 2021, which is the period covered by the empirical study, are less than the threshold value of one, Logit-Probit analyses could not be performed. When we look at the graphs and we see that it is not correct to accept a threshold value less than one and specific to the Turkish economy, because the key indicators are declining and there is no variation from this pattern in the following periods. Because of this, the CBT's FX reserve adequacy indicator was solely evaluated using the "Foreign Exchange Reserves/20% of M2 money supply" (Figure 1). The following logit-probit analysis was carried out based on the values of the dependent variable ResM2:

$$\begin{cases} 1 \; if \; \text{ResM2} > 1 \\ 0 \; if \; \text{ResM2} < 1 \end{cases}$$

The literature on the issue was carefully evaluated in the selection of the independent variables to be utilized in the empirical investigation, and the suitable variables were incorporated to the model.

Table 1: Independent Variables to be Used in the Model

Variables	Symbol	Referance
Current Account Balance	CAB	Frenkel and Jovanovic (1981), Karfakis (1997), Romero (2005), Cinel and Yamak (2014), Gümüş (2016), Sula (2011), Bird and Ragan (2003), Shcherbakov (2002), Gosselin and Parent (2005), Chowdhury et al.. (2014), Machlup (1966), Kelly (1970), Irefin and Yaaba(2011), Kartal and Tan (2018), Mahraddika (2019), Yüksel and Özsarı (2017), Gögül (2020),
External Debt (Short Term)	ED	Frenkel and Jovanovic (1981), Bird and Ragan (2003), Cinel and Yamak (2014), Gümüş (2016), Senibi et al. (2016), Shcherbakov (2002), Gosselin and Parent (2005), Machlup (1966), Irefin and Yaaba(2011), Kartal and Tan (2018), Mahraddika (2019), Yüksel and Özsarı (2017),
FED İnterest Rate	FED	Cinel and Yamak (2014), Karfakis (1997), Jo (2011), Gümüş (2016), Bird and Ragan (2003), Courchene and Youssef (1967), Irefin and Yaaba(2011), Mahraddika (2019), Yüksel and Özsarı (2017), Ghosh (2016)
USD/TL Effective Exchange Rate	EFEXC	Cinel and Yamak (2014), Romero (2005), Jo (2011), Senibi et al. (2016), Kasman and Ayhan (2008), Sula (2011), Irefin and Yaaba (2011), Disyatat and Mathieson (2001), Panda and Trivedi (2016), Gosselin and Parent (2005), Chowdhury (2014), Minjie and Degong (2016)
Central Bank İnterest Rate	TLİNTR	Cinel and Yamak (2014), Gümüş (2016), Irefin and Yaaba (2011), Bird and Ragan (2003), Gosselin and Parent (2005), Chowdhury (2014), Ghosh (2016)
Consumer Price İndex	CPI	Gumuş (2016), Chowdhury (2014), Kartal and Tan (2018), Yüksel and Özsarı (2017),
Import	IMP	Cinel and Yamak (2014), Yüksel and Özsarı (2017), Ghosh (2016), Gosselin and Parent (2005), Chowdhury (2014), Minjie and Degong (2016), Minjie and Degong (2016),
Export	EXP	Chowdhury (2014), Yüksel and Özsarı (2017), Ghosh (2016).

4. Method

The Logit and Probit models were used to investigate the factors influencing the CBRT FX Reserves to remain above and below the Optimal level. These are models in which the dependent variable has the values 0 and 1, i.e. the dependent variable is made up of dummy variables. In these models, estimate is done using the maximum likelihood approach, and assumptions such changing variance, autocorrelation, and structural break are ignored in terms of consistency of the results.

The logit model is a model developed from the logistic cumulative distribution in which the dependent variable is a dummy variable with two or more values. The logit model is also known as a logistic regression model in the literature. Despite being non-linear, this model is a regression method that can be linearized if

necessary. The logit model is a sophisticated statistical method that computes anticipated values of the dependent variable as probability. The dependent and independent variables in this model are generally continuous (Uslu, 2019: 157). The probability of getting a value of 1 for the dependent variable is estimated here as a result of changes in the independent variables:

$$P_t = E\left(Y = \frac{1}{X_i}\right) = \frac{1}{1+e^{-(\beta_0+\beta_1 X_i}} \quad (1)$$

The odds ratio, which is the ratio of the likelihood of an event occurring to the likelihood of it not occurring, has the value Ez. The Logit value is obtained by taking the logarithm of this value:

$$L_i = \ln\left(\frac{P_i}{1-P_i}\right) = Z_i = \beta_0 + \beta_1 X_1 \quad (2)$$

The logit model's β_{11} coefficient shows the change in Logit versus a 1-unit change in the X_i argument. After acquiring this value, the probability of logit realization for a given value of the X_i independent variable is determined. Instead of the F test, the Logit regression model employs the Maximum Similarity Rate and the Wald Test (Demirci and Astar, 2011: 6).

The binary selection models are the probit regression model and the logistic regression model. As a result, the structure's functions and tasks are similar to the logit model (Cebeci, 2012:132). The estimated value of the dependent variable in the probit regression model is expressed as the value of the standard normal distribution function. Probit is the value used to calculate the standard normal distribution function. The dependent variable in the probit model is binary, as it is in the logit model. The probit model's factors should be quantitative or categorical, and they should be translated into binary variables (Akkaya and Kantar, 2018: 585).

The structure of Probit models is derived from the cumulative normal distribution function. Least Squares, Maximum Likelihood, Weighted Least Squares, Minimum Chi-Square, and Iteratively Weighted techniques are used to estimate this model (Bierens, 2004: 45). The Maximum Likelihood approach is commonly employed (Cebeci, 2012: 135). The maximum probability of a similarity link between the population and the sample taken from the population is determined using this method:

$$P\left(Y = \frac{1}{X_i}\right) = \frac{\beta_0}{\beta_{0+\beta_1 X}} \quad (3)$$

Here, is the standard normal distribution's cumulative distribution function, and are the unknown parameters to be estimated.

The LR test determines the accuracy of the expected results in Logit and Probit models. By examining the outcome of LR>0.05, it is decided that the model will give relevant results. Furthermore, the Psuedo McFadden R2 value is one of the most commonly utilized success criterion in the model's success evaluation (Uslu, 2019: 159).

Variable coefficients cannot be readily interpreted in Logit and Probit models. The direction of the likelihood of the effect of the independent variable on the categorical dependent variable is determined solely by the signs of the coefficients (Cebeci, 2012: 141). The marginal effects are calculated for the interpretation of the coefficients using the averages of the independent variables. In this case, the probability of the change in the probability of the value of the dependent variable due to the independent variable is calculated not only by the B1 coefficient, but also by taking into account the probability level whose change is measured (Güriş and Çağlayan, 2011: 660). The following are the formulas for calculating marginal effects:

$$\frac{\vartheta P_i}{\vartheta X_i} = \frac{\beta_i e^{-i_t}}{(1+e^{-i_t})^2} = \frac{\beta_i[\frac{1-P_i}{P_i}]}{[1+((\frac{1-P_i}{P_i})]^2} = \beta_i P_i(1-P_i) \qquad (4)$$

The percentage effect of a 1-unit increase in the independent variable on the chance of the dependent variable taking a value of 1 is determined from this equation and using this value.

5. Empirical Results

Because the model's variables are in different decimals, logarithmic transformation was applied to all variables except those that were not expressed as a ratio. As a result, analyses were performed using the semi-logatirmic model and logit-probit approaches. Because probit models require stationary series, the Augumented Dickey-Fuller and Phillips-Perron Unit Root Tests were used to determine whether the data set was stationary.

Table 2: Unit Root Tests

Variable	ADF		PP	
	With constant	With constant and trend	With constant	With constant and trend
EXP	-5.4766***	-6.1155***	-5.3063***	-6.0131***
IMP	-3.0088***	-2.9940***	-4.7966***	-5.0157***
ED	-3.0767**	-3.4770**	-3.1338**	-3.6389**
CAB	-3.8667***	-4.9698***	-3.5948***	-5.0040***
FED	-1.6353	-1.7832	-1.2883	-1.3854
ΔFED	-7.3909***	-7.4229***	-7.4770***	-7.4991***
CPI	2.2336	-1.1354	2.2999	-1.3785
ΔCPI	-5.2635***	-5.9362***	-7.5494***	-7.7141***
TLINTR	-2.3722	-2.9650	-1.7234	-2.2638
Δ TLINTR	-4.9214***	-4.8958***	-4.9025***	-4.8741***
USDTL	0.0643	-4.3581***	0.1790	-3.1979*
ΔUSDTL	-7.9723***	-6.7599***	-6.3869***	-6.3500***

Note: (*) Significant at the 10% significance level; (**) Significant at the 5% significance level; and (***) Significant at the 1% significant level. The choice was made using the Schwarz information criterion and the critical values estimated by MacKinnon (1996).

According to both ADF and PP tests, the IMP, EXP, ED and CAB variables were stationary in level values, whereas the other variables became stationary when the first difference was obtained. The first differences of the USDT, TLINTR and CPI variables were made stationary in this example by taking I(1), and the model was estimated using the data set with the difference taken for the relevant variables.

Table 3: Logit/Probit Model Outcomes

	Logit Model		Probit Model	
Variables	Coefficient	Probability	Coefficient	Probability
ΔUSDTL	-0.974	0.02**	-0,77	0,06*
ΔUSDFED	-2.47	0.01	-3.59	0.45
ΔCPI	-0.99	0.00**	-1.29	0.03**
ED	-1.02	0.02**	-1.12	0.00***
CAB	-0.090	0.00***	-0.01	0.00**
IMP	51.1	0.23	35.11	1.01
EXP	-46.2	0.15	-45.76	1.10
TLINTR	21.43	0.38	18.56	0.26
Constant	-5.06	0.03**	-4.83	0.01**
LR	17.93	0.00**	17.93	0.00
Log Likelihood	-7.41		-7.12	
R^2 McFadden	0.58		0.59	
SSR	1.03		1.03	
AIC	0.56		0.56	

Note: ((*) Significant at 10% significance level; (**) Significant at 5% significance level; and (***) Significant at 1% significant level.

The logit and probit results for this study almost completely confirm each other, with the same statistically significant variables in both the predicted logit and probit models and the closeness of the R^2 McFadden value, which are the results of model success, the sum of squares of error, and the same AIC value. The variables USDTL, CPI, ED, and CAB were shown to be statistically significant in both models. Although the R^2 Mc Fadden value for the Logit model is 0.58 and 0.59 for the Probit model, the goodness of fit in describing changes in the categorical dependent variable is deemed adequate. Furthermore, the small sum of squares of error (SSR) value is a statistical indicator of the model's good estimation.

In the calculation of CBRT Foreign Exchange Reserves, both CBRT rates and FED rates were found to be statistically insignificant. One explanation for this is that monthly and quarterly research cannot adequately represent the effect of interest rates. The effects of changes in interest rates on other macroeconomic and categorical variables are stronger in higher frequency data. The variables effective exchange rate, inflation, current account deficit, and short-term external debt are found to be statistically significant. Furthermore, while the variable of current account deficit was found to be statistically significant, the variables of import and export, two other crucial variables of foreign trade, were found to be statistically insignificant. The coefficients are not known to be readily interpretable based on

the results of the Logit and Probit models. In this situation, the coefficients are interpreted after the estimation by performing a marginal transformation.

Table 4: Marginal Effects Transformation Results After Logit/Probit Estimation

	Logit Model		Probit Model	
Variables	Coefficient	Probability	Coefficient	Probability
ΔUSDTL	-0.0013	0.1502	-0.0011	0.1403
ΔFED	-0.0378	0.2016	-0.0385	0.1093
ΔCPI	-0.0241	0.0360**	-0.0013	0.0300**
ED	-0.0102	0.0001**	-0.0010	0.0298**
CAB	-0.0110	0.1803	-0.0290	0.0130
IMP	4.206	0.2108	3.708	0.1891
EXP	-2.902	0.3004	-3.011	0.2874
TLINTR	2.016	0.1204	2.064	0.1181

Note: (*) Significant at the 10% level of significance; (**) Significant at the 5% level of significance. (***) Significant at the 1% level of significance. The marginal transformation was calculated using the mean or median, taking into account the data sets' normality.

Although the Logit and Probit model findings showed that CPI, CAB, ED, and USDTL variables were statistically significant, the marginal effects analysis revealed that only ED and CPI variables were statistically significant. In this scenario, in addition to interpreting the direction of the influence of the CAB and USDTL variables on the categorical dependent variable, the coefficients of the DB and CPI variables that are statistically significant as a result of the marginal effects analysis are also interpreted.

One-unit adjustments in the current account balance and the USD-TL Effective Rate reduce the CBRT Gross Foreign Exchange Reserves, causing them to fall below the optimum level. When all other factors remain constant, a one-unit increase in short-term external debt generates an estimated 0.001 decrease in the probability that the CBRT Gross Foreign Exchange Reserves will remain at an optimal level in terms of meeting the M2 money supply. A one-unit increase in inflation, on the other hand, results in an estimated 0.02 decrease in the likelihood that the CBRT's foreign exchange reserves will remain at an optimal level for fulfilling the M2 money supply. In economic terms, the impacts of the factors deemed statistically significant in the model on the dependent variable are the predicted results.

The findings are similar to the studies of Cinel and Yamak (2014), Gümüş (2016), Yüksel and Özsarı (2017), which are different in terms of the fact that the Export and Import variables are found to be statistically insignificant among the factors affecting the CBRT's FX Reserves and the direction of the variables.

6. Conclusion

In the history of economic crises and, more broadly, unfavorable cyclical changes produced by internal and external shocks, states with significant national reserves have been found to be less influenced by monetary shocks. National reserves,

according to some economists, are countries' "economic war chests." During the COVID-19 pandemic, which occurred in the last two years and had a negative impact on the global economy, the importance of national reserves was highlighted once again in terms of the monetary sustainability of policies implemented by the health sector or governments during the pandemic process. The fact that the US dollar forms a large portion of practically all of the world's national foreign currency reserves is also vital for the long-term stability of the exchange rate stability of the countries' national currencies versus the US dollar.

The cyclical fluctuations in the US economy now, like those in the 1930s, have a huge impact on global economies. The countries chosen based on the size of their national reserves came to the fore in the fight against structural currency issues suffered in many countries around the world as a result of the crisis originating in the United States during the 2008 Mortgage Crisis. In terms of the utilization and quality of national reserves, net foreign exchange reserves are considered rather than gross reserves. The fact that national reserves are free of gold, FX SWAPs, and even SDRs appears to be a more accurate indicator of the country's national reserves.

Despite the fact that quantitatively substantial growth indications have been recorded in Turkey's economy in recent years, the country's price and exchange rate stability has become chronic. It was discovered, in particular, that the CBRT's net foreign exchange reserve-SWAP value, which made large expenditures on national foreign exchange reserves to preserve exchange rate stability, was less than zero, implying that the country's net national savings were negative. This situation's economic and political anxiety prompted criticism of the CBRT's foreign exchange reserve policies.

The factors influencing the CBRT's foreign exchange reserves are at an optimal level, and the likelihood of remaining at that level has been investigated in the study. The relationship between the CPI, CBRT policy rate, FED policy rate, short-term external debt, imports and exports variables, and the dummy dependent variable, which indicates whether 20 percent of the CBRT Gross Foreign Exchange Reserves/M2 monetary size is greater than or less than one value, was investigated for this purpose. CPI and short-term external debt variables were shown to be statistically significant in the model created using Logit and Probit methods. According to the study's final findings, rises in CPI and short-term external debt values enhance the likelihood that gross foreign exchange reserves will remain below the optimal level. This result confirms the empirical findings of studies undertaken in the literature, whether on the CBRT or on other national reserves.

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